The biomass feedstock Process Demonstration Unit (PDU) has an innovative modular and reconfigurable design that helps bioenergy companies find the best way to convert feedstock into fuel.

Biomass Feedstock National User Facility

Solving feedstock challenges today

The energy industry is poised for a dramatic worldwide transformation. Increasing demand and regulatory changes will require a diverse mix of technologies that is more reliant on renewable energy production. That mix undoubtedly includes bioenergy.

At the Biomass Feedstock National User Facility (BFNUF), our researchers help overcome key technical barriers facing the U.S. bioenergy industry by investigating advanced feedstock supply and logistics, analysis and sustainability, preprocessing and characterization. In short, we help make biofuels more sustainable and more profitable for U.S. bioenergy companies. The User Facility is arguably the most complete feedstock preprocessing R&D facility in the world.

Who Do We Help?

BFNUF has provided customized technical support to more than a dozen leading U.S. feedstock, bioenergy and technology companies. Along the way, BFNUF has processed more than 500 tons of raw biomass materials, producing a wide variety of products from biomass sources ranging from forest and agriculture feeds to municipal solid waste.

Process Demonstration Unit

The biomass feedstock Process Demonstration Unit (PDU) is the flagship of the BFNUF. The PDU's innovative design—modular and reconfigurable—helps bioenergy companies find the best way to convert feedstock into fuel. The full-scale preprocessing system is located in a 27,000-square-foot high bay at INL's Energy Systems Laboratory.

The PDU can process 2 to 5 tons of biomass per hour using a variety of techniques including hammer mill grinding, rotary drying, pelleting, cubing and multiple packaging options. The PDU is a unique tool to accommodate the varied needs of process design and feedstock supply.

Supply Chain Development

At BFNUF, our research team combines supply and

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The Energy of Innovation

INL Idaho National Laboratory

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logistics experience, feedstock characterization and supply chain modeling to support collaborations in feedstock supply chain development.

The BFNUF Characterization Laboratory analyzes feedstocks and feedstock storage performance to aid customers in the development of a high-quality product. Researchers evaluate the physical properties of material prior to deciding on feedstock conversion pathways. Physical and chemical material evaluations are entered in the Bioenergy Feedstock Library database to provide fundamental data on biomass characteristics for researchers and industry.

BFNUF researchers also develop feasibility studies, techno-economic assessments, characterization of biomass resources, and supply chain design to move the product where it needs to go. Our understanding of cost, quality and risk tradeoffs helps customers establish a successful supply chain.

Feedstock Development, Scale-Up, and Integration

BFNUF is uniquely qualified to assist partners with the development of feedstock specifications thanks to our integrated preprocessing system, the Process Demonstration Unit (PDU), and our in-house characterization laboratory.

Whether preprocessing feedstock to a customer's specifications or collaborating to develop custom specifications, BFNUF provides a complete suite of services: sourcing for common and distinctive feedstocks; process development, testing and design; feedstocks processed to specifications; feedstock characterization data sheets; and packaging and shipping for testing. These capabilities allow toll processing to supply industry collaborators with industrial feedstocks for testing and validation of their conversion processes.

The BFNUF Characterization Laboratory analyzes feedstocks and feedstock storage performance to aid customers in the development of a high-quality product.

INL researchers' experience developing these feedstocks extends to a variety of projects:

Biofuels projects—Our PDU grinding and drying processes produce bulk feedstocks at moisture and particle size specifications for feed handling and conversion testing.

Biopower Projects—Our PDU pelleting and cubing systems supply feedstocks for test burns, while our pilot-scale torrefaction systems allow biopower producers an effective means to evaluate this option.

Waste-to-Energy Projects—Our PDU grinding, pelleting and cubing systems process post-sorted municipal solid waste for gasification testing.

BFNUF's ability to develop feedstock specifications allows customers to develop custom feedstocks that improve feed handling performance, conversion performance and the capabilities of industrial preprocessing equipment.

BFNUF also offers lab and pilot-scale testing for industrial feedstocks during process, scale-up and integration. For the customer, this means accelerated commercialization and fewer costly delays during commissioning and start-up.

For more information

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